

REMARKS

This amendment is responsive to the official action dated July 29, 2003.

Claims 9 and 10 were pending in the application. Claims 9 and 10 were rejected.

No claims were allowed by the Examiner.

By way of this amendment, Claims 9 and 10 have been amended.

Accordingly, Claims 9 and 10 are currently pending.

I. **REJECTION OF CLAIMS UNDER 35 USC 103**

The Examiner rejected Claims 9 and 10 under 35 USC §103 (a) as being obvious and unpatentable over the combination of JP407106784A in view of US Patent 6,200,630 (Eriksson). The Examiner stated that JP407106784A teaches a process including the steps of providing a base thermoplastic polymer matrix, mixing a thermally conductive filler into said base matrix, injection molding the mixture into a net-shape molded configuration having a contact surface and installing a metallic plate over the part to shield against EM radiation. The Examiner further states that while JP407106784A does not disclose applying a metallic coating, Ericksson discloses applying a metallic coating via a screen or tampon printing method and that it would have been obvious to one skilled in the art to replace the metallic plate of JP407106784A with the printed metallic coating of Eriksson to arrive at the present invention.

The Applicant asserts however that the configuration shown in JP407106784A is an undesirable configuration that complicates assembly, increases the likelihood of chip failure and is exactly the type of assembly that the present invention was developed to overcome. Contrary to the unsupported and broadly overall generalized statement made by the Examiner, the device in JP407106784A cannot simply be placed in direct contact with the electronic component. This arrangement would surely result in chip failure from EMI exposure. The metallic plate is included specifically to isolate the electronic component from the housing and to intercept EMI waves. The additional

drawback to this configuration is that since the chip cannot be placed in direct thermal communication with the outer housing, additional thermal interface gaps are introduced that greatly decrease the thermal performance of the overall assembly. Specifically, by installing this plate in this configuration, the assembly introduces an air gap that causes severe reduction in the thermal conductivity of the heat dissipation device and reduced performance in the overall assembly. Therefore, there is no provision for a contact plate or contact surface that is direct communication with the electronic device. Further, while the device in JP407106784A may inherently dissipate heat, this inherent dissipation is at a low and inefficient level due to the large air gaps and thermal interface gaps created in the disclosed assembly.

The disclosure provided in Ericsson describes a part that has an applied metallic foil layer. This application is virtually indistinguishable from the metal shield provided in JP407106784A. There is no support for the assertion that the applied foil in Ericsson is fully bonded with the thermally conductive part. In fact, there is no disclosure relative to a thermally conductive part. While the interface gaps in the Ericsson may be smaller than the interface gaps in JP407106784A, they still exist. The present invention eliminates this interface gap making a highly efficient part that is designed to be placed in direct contact with the electronic components.

Further, the foil layer does not entirely encompass the part. In fact, the printing method would not allow for the applied foil to be applied to the entire outer surface of the part.

The art cited by the Examiner simply cannot be combined to arrive at the present invention. By combining the disclosure in JP407106784A with Eriksson, one skilled in the art would arrive at an injection molded thermally conductive polymer housing that includes an applied layer of foil that is not in intimate contact with the part geometry. While the Eriksson disclosure would provide an improvement in the overall performance of the part as compared to the large air gap found in JP407106784A, the method still results in an air gap. This air gap results because regardless of how smooth the molded surface of the base part is, microscopic surface imperfections and mold irregularities

exist on the surface of the part. When a foil is applied and tampon or screen-printed as disclosed in Eriksson, while the foil conforms generally to the overall geometry of the part, it does not conform to fill all of the smaller voids and irregularities in the surface of the part. The present invention, by utilizing a plating process for applying the metallic coating, includes a metallic coating that is in intimate contact with the thermally conductive polymer core thereby eliminating the air gap and the associated thermal transfer losses.

More importantly, the combined disclosures do not provide for a part that is placed in direct contact with a heat generating electronic component to conduct heat directly therefrom. The only disclosure relative to heat dissipation is a general concept that eventually heat will build to a threshold level within the JP407106784A enclosure so as to be passively dissipated through the walls of the enclosure. In contrast the present invention is placed directly into contact with the heat generating device to actively remove the heat therefrom.

Since it is clear that the prior art references cited by the Examiner are not combinable to arrive at the claims of the present invention as amended, the combination of JP407106784A and Eriksson cannot render the present invention obvious. Clearly while Eriksson improves upon the disclosure in JP407106784A, the combination still includes flaws that are overcome by the present invention. Since there is no teaching in either of the cited references alone or in combination that render the present invention obvious the Applicant asserts that this rejection is inapplicable and respectfully requests withdrawal of this grounds for rejection.

II. CONCLUSION

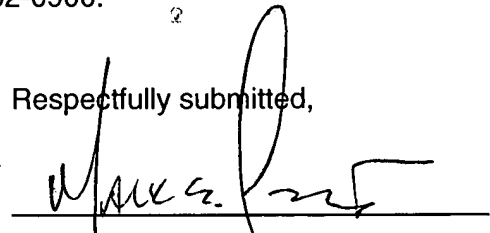
Accordingly, claims 9 and 10 are believed to be in condition for allowance and the application ready for issue.

Corresponding action is respectfully solicited.

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PTO is authorized to charge any additional fees incurred as a result of the filing hereof or credit any overpayment to our account #02-0900.

Respectfully submitted,



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